A GRAIN of Namib sand, if scanned under an electron microscope, may reflect from deep within its refractory prisms the colours and forms of the desert, which shaped it. Ancient philosophers and, more recently, innovative scientific minds speculate on the possibility that in the micro forms of a landscape you can detect the larger world captured by some miracle of universal memory. What then, is the Namib?
It is an area of 276 000 km² whose name originates from the Nama language and simply interpreted means “bare place”. It was an easy transition to name the entire country after this word when Namibia, 97 percent of which is arid or semi-arid, took its rightful place in the world community some 80 million years after an arid birth. By international norms 33 percent of Namibia is classified as desert and semi-desert. In this dehydrated world, average annual rainfall is less than 200 mm, decreasing to below the hyper-arid threshold of 100 mm as one enters the realm of the true desert.

Just as there is a microscopic world of non-living colours and forms in the Namib, the living world mimics this process. Uncountable numbers of minute forms of life exist, some of them smaller than the grains of sand among which they live. The biomass, or weight of living things in the entire Namib will never be known, but it must be beyond our wildest imaginings to grasp. The sheer weight of numbers of each of the hundreds of plant and animal species inhabiting “the bare place” underlines the fact that, per unit area, this is the most unique, diverse and richest desert on the planet.

On a mega scale the Namib was forged by the world’s two mightiest natural forces: wind and water. A high pressure air cell dominates the upper atmosphere of Namibia’s coast, directing descending, stable air, which inhibits rain-bearing cloud formation. Supplementing this, the driving southerly winds create an upwelling of cold Antarctic water in the Benguela Current, thereby cooling and stabilising further the anti-rain atmosphere. Only when these awesome powers abate temporarily can tropical storms blow across Africa from the Indian Ocean, bringing brief, often violent and unpredictable rainfall to the desert.

The Namib’s vibrancy, reflected by its plants and animals, depends largely on these infrequent pulses of water to display its dazzling array of adaptations. Tiny seeds germinate, eggs hatch and larger creatures mate, while the dry arteries of a dozen dormant river-beds swell and flood. Within days the desert softens, greening and producing a multitude of life. This is variety on an unsurpassed scale: fields of lilies appear on barren gravel plains, ephemeral grasses blow full in the wind, a million finchlarks wing in to nest, and oryx, the prince of antelopes, walk incredible distances across dune-fields to seek out the most nutritious plants.

Whereas the Namib’s sister desert, the Kalahari (originally called Kgalagadi, meaning “always dry”) shares these infrequent rain events, it has no alternative access to moisture. The Kalahari is a hot, dry desert: the Namib is relatively cool and moist. The very cause of the Namib’s barrenness, namely the cold, upwelled Benguela Current, also carries a blessing in the form of fog. This alternate source of moisture is the Namib’s secret. In the absence of rain, banks of warm moist oceanic air surge toward the land, condensing as they meet the colder water to precipitate as far as 100 km into the interior.

Successful living in a desert requires adaptation, and this is exactly what many plants
and animals have done, with a period of nine million foggy years in which to learn the best strategies. Those who failed this lengthy tutelage of nature did not survive, but many have the lesson imprinted indelibly in their genes. And so, primitive “window algae”, growing under translucent quartz, rapidly absorb the tiny water droplets floating on fog-bearing winds to condense on the translucent stones. Black “tok-tokkie” beetles execute head stands on the top of dune slip-faces to achieve what is called “fog basking”. By facing into the wind with straightened rear legs and lowered head, the insect’s back causes moisture to condense, draining it drop by drop to the mouthparts, where it drinks - and survives! Species such as the tiny trench-digging beetles construct shallow, body-width furrows several times longer than they are, angled at a tangent to the incoming fog. When moisture condenses on the trench ridges, the minuscule trench-diggers display near-perfect logic as they move slowly back along their sandy structures, drinking the life-sustaining precipitate caught between the grains.

Little is known about the additives conveyed by fog. Evidence suggests that it is the conveyor of critical substances, which facilitate a chemical transformation of the desert’s surface calcium carbonate into calcium sulphate or gypsum. Thereby the central Namib’s 10,000 km² contain the largest “plaster of Paris” plain in the world. South of it lies the dune sea, an additional 30,000 km² of sand shapes and subtle colours. Nowhere is the Namib better illustrated than in this world of sand and silence, broken by sounds of wind reshaping the intricate mosaic of uncountable sand grains.

Sand was celebrated at an international symposium held in Swakopmund and aptly titled “Dunes 89”. At this conference, 125 experts from 20 countries exchanged opinions about the nature and characteristics of sand grains when they are encountered in numbers large enough to call them dunes. One sand expert, a dune geomorphologist, informed the audience that many dune shapes can be recognised, using descriptive names such as “parabolic”, “coppice”, “transverse”, “barchan”, “crescentic”, “star” and “linear”.

The equation for survival in the Namib is the ability to balance water loss by an equivalent intake of water in whatever form it may be available. Thus, in the true desert, creatures from mice to elephants walk a water “tightrope” in an environment where potential evaporation is 3,500 mm annually but precipitation by fog and rain less than 100 mm. Decreasing moisture in the air is often accompanied by increasing temperature, and the body’s vital life processes slacken as dehydration sets in. Humans, one of the most inefficient users of body water, are at the highest risk of all land animals if they face the desert on its terms and fail to recognise the water-temperature link. No person can off-load deep body heat by panting at 274 times per minute like a springbok does. Such respiration rates are intolerable to the unadapted human physiology.

The Namib existed in a pristinely perfect manner for millions of years. Then, during...
the last two hundred years, industrialised human society appeared, driven by ever-increasing demands for improved standards of living, wealth, development and, unfortunately, greed. The past century counts no more than a few seconds in the eternity of the desert’s time clock, but it has witnessed the most devastating impact on the finely-tuned balances and counterbalances, which previously enabled the natural order of things to tick smoothly.

Following the onslaught of open-pit mining, high-speed roads linked population centres, towns mushroomed and their inhabitants ventured into the desert. A major player in the desert’s deterioration was the advent of precision engineered four-wheel drive vehicles capable of penetrating the remotest, most fragile components of the Namib. Their tyre tracks lie like unhealed scars on the desert’s skin which, strangely like living tissue, loses moisture once the gypsum crust has been violated.

This superficial wounding and insidious dehydration of the Namib is regrettable, but it is negligible compared to the trauma which has taken place during the past 30 years. Pumping of underground aquifers to supply mines and expanding towns has bled the Namib of its most critical resource. The equation is simple: more water is being removed than what is replaced by rainfall, and the deficit may be deadly. Riverine vegetation is dying because roots cannot penetrate to the depth that modern boreholes can.

If this plundering of the Namib continues, there will be a price to pay in human terms. The Namib will not die as a desert, but it will become unliveable to modern society accus-

A herd of elephant moves purposefully through the shifting dunes of the Skeleton Coast Park. The northern Namib is the only place in the world where elephant live permanently in a hyper-arid desert.